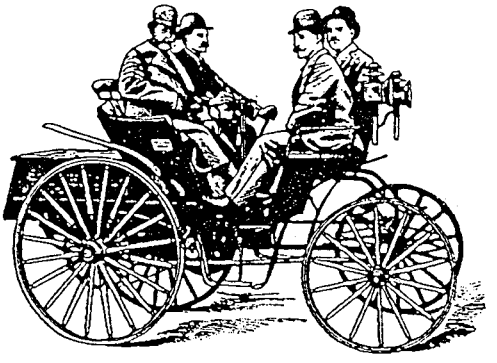
WRITING A WASTE REDUCTION PLAN



A workbook for motor vehicle maintenance facilities

Sponsored by:
The University of Tennessee
Center for Industrial Services
County Technical Assistance Service
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WRITING A WASTE REDUCTION PLAN
for a
MOTOR VEHICLE MAINTENANCE FACILITY

Why Do We Need a Written Waste Reduction Plan?

THE EASY ANSWER to that question is that the Hazardous Waste Reduction Act of 1990 requires it of all hazardous waste generators in Tennessee[1]. The Act provides for civil penalties of up to $10,000 per day for failure to file, refusal to comply, or giving false information.

BUT THE REAL ANSWER IS MUCH MORE COMPLEX!

Here are some reasons you may be able to relate to:

- Your company, when it generates hazardous wastes, assumes perpetual liability for any future damage those wastes may do to the environment, **even long after you have "disposed" of them.**

- Furthermore, every time you prepare and sign the EPA-required hazardous waste manifest, **you certify that you are making your best efforts to reduce hazardous waste generation.** Having this plan in writing and making annual progress reports documents that certification.

- Reducing the rate at which your facility generates hazardous wastes will correspondingly reduce employee exposure to materials which may be harmful to their health.

- Managing, storing and disposing of wastes - **hazardous or not** - requires manpower, paperwork and several less obvious expenditures which make your operation that much less profitable.

- The procedure involved in writing an effective waste reduction plan requires that every operation be carefully examined by a team of individuals with different priorities and viewpoints. The observations made and the questions asked, if followed up, are likely to result in improvements in productivity, quality and safety, as well as in waste reduction. This is an unforeseen bonus many companies have reaped.

- On top of all this, you will probably find that much of the waste is generated **unnecessarily**, and can be eliminated with a little effort, changes in procedures, and waste awareness training, thus improving profitability without significant expenditure.

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[1] The Tennessee Hazardous Waste Reduction Act of 1990 (TCA 68-46-301 et seq.) required large quantity generators to have the plan in place on January 1, 1992; small quantity generators must have a plan in place by January 1, 1994.

Is Our Plan a Public Record, Available to Anyone Who Wants to See It?

No. Your plan (and your annual updates) remain on your premises. They must be available for inspection, but are not filed with the Solid Waste Control Board or any other State Agency. You report your progress to the State in your annual Hazardous Waste Activities Report. In that report, the information is coded to reveal only proportional data. **The key to the code is contained only in your plan.** [Section 311]

Are We Required to Make a 25% Reduction in Our Hazardous Waste?

Not necessarily. The 25% reduction before June 30, 1995 is a **statewide reduction goal.** Individual generators have no limits (top or bottom) set on the goals they set. Generators are expected to set goals which support Tennessee's policy that, "**wherever economically and technically feasible**, the generation of hazardous waste is to be prevented or reduced as expeditiously as possible". [Section 302(a)]

Does the Solid Waste Management Act of 1991 Also Require Us to Reduce Solid Waste Generated and Hauled to the Landfill?

No. This law **requires no action** by solid waste generators. But it **does** require counties and municipalities to provide the means by which solid waste landfilled and incinerated will be reduced 25% by December 31, 1995. What this really means is that industrial generators will eventually find disposal costs increasing rapidly, so that solid waste reduction will make greater **economic sense** each year that passes. **For that reason, we recommend that, as long as you are writing a waste reduction plan, you include solid waste reduction.** We suspect that many small quantity generators of hazardous waste will find more economic incentive for reducing solid waste than for hazardous waste.

How Do We Get Started on A Plan?

The key word in the title of the plan is "**reduction**". In order to plan how you are going to reduce waste, it is first necessary to know a great deal about your wastes. At the very least, you must know what your wastes are, and how much you generate now. The way to do this is to perform what has come to be known as a **Waste Reduction Assessment.**

Most companies agree that a team approach, where a team leader - or **cause champion** as he is sometimes called - has available for ideas and evaluation a broad base of talents and insights. For instance, who knows more about the process that generates the waste than the machine operator? Yet, persons who maintain the equipment often can throw light on the causes of

wasteful equipment performance. Those who specify and procure supplies and raw materials and those who set and monitor quality standards can help identify wasteful practices and propose methods of correcting them. Thus, the assessment team should have the broadest possible make-up. Bringing in "outsiders" to take part is often a great help, because they are not inhibited in asking "Why do it this way?", nor will they be as likely as employees to suffer from the "sacred cow" and "if it ain't broke, don't fix it" syndromes.

During an assessment, each waste stream will be identified, quantified and profiled. The profile will include the operation or process which causes it to be generated, factors which influence quantity, and all other relationships which can be uncovered between process and waste stream. Once the wastes have been profiled, your **opportunities** for waste reduction are defined. Remember, **EVERY WASTE STREAM IS A WASTE REDUCTION OPPORTUNITY!**

LIST ALL THE HAZARDOUS AND NON-HAZARDOUS WASTE STREAMS GENERATED AT YOUR FACILITY.

1. Used Oil
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HAZARDOUS WASTE IDENTIFICATION

The first responsibility for a potential hazardous waste generator is to identify all hazardous wastes generated in the operations. A waste is hazardous if it 1) appears on one of the EPA's hazardous waste lists, and/or 2) exhibits a hazardous characteristic defined in the hazardous waste rules. This note explains how to make these determinations.

The EPA has four hazardous waste lists. Any waste that appears on these lists is hazardous and has a designated waste code. The first list is from nonspecific sources and is called the "F" list. An example of an "F" listed material is "spent cyanide plating bath solutions from electroplating operations", and this carries an F007 waste code. The "K" list is for wastes from "specific sources". Wastewater treatment sludge from the production of toxaphene is a "K" listed waste with the waste code K041. Two other lists are for discarded commercial chemical products, off-spec materials, and spill cleanup residue resulting from any release of the listed "pure" products. The "P" list is acutely toxic and the "U" list is other hazardous material.

If a waste exhibits a hazardous characteristic, then it is a hazardous waste. The four characteristics are:

IGNITABLE - A waste with a flash point ≤ 140° F is an ignitable hazardous waste with the waste code D001.

CORROSIVE - pH ≤ 2.0 or ph ≥ 12.5. Acids and bases used in the workplace create corrosive hazardous wastes.

TOXIC - Contains certain levels of toxic chemicals such as lead, chromium or trichloroethylene. The complete list is in the TCLP Technical Bulletin.

REACTIVE - For example, a material that is unstable or reacts with water.

The first step for identifying a hazardous waste generated in the workplace is to review the four lists and determine if any of the wastes appear on them. Next, determine if they exhibit one of the four characteristics. Most Material Safety Data Sheets (MSDSs) will list the characteristic properties of the material. Note that just because an MSDS show the raw material has a characteristic of a hazardous waste (e.g., a flash point ≤ 140° F), the waste from the process that uses that material will not necessarily exhibit the characteristic. The process may have altered it in some way. Conversely, materials that do not display the hazardous characteristic will not necessarily produce a waste that is not characteristic. You must combine your knowledge of the materials and the process to determine if the wastes are characteristic or listed. With most materials it will be obvious. Other times, it is not so clear. You can get assistance with identifying hazardous wastes from Tennessee Department of Environment and Conservation (615 532-0780), from disposal vendors, from the EPA Superfund Hotline (800 424-9346), and of course, from our office. At times, it will be necessary to obtain a laboratory analysis of the waste to determine if it exhibits one of the four characteristics.

SMALL QUANTITY GENERATORS

HAZARDOUS WASTE RULES AND REGULATIONS

A Small Quantity Generator (SQG) of hazardous waste has generated 100 kg to 1000 kg of listed or characteristic hazardous waste in any calendar month. The requirements for a SQG are listed here.

1. The hazardous waste generator must determine the type and amount of hazardous waste generated and keep records documenting the basis of this determination (generators knowledge, analysis, etc.)

2. The company must have an EPA Identification number.

3. The SQG never generates more than 1000 kg of hazardous waste in any calendar month. If the amount generated in each month of the calendar year is below 100 kg, the company may become a Conditionally Exempt Small Quantity Generator.

   The date accumulation starts must be marked on each container and visible for inspection. During accumulation, the container must be marked "Hazardous Waste".

4. The hazardous waste must be disposed of within 180 days of when the waste is accumulated for storage. If the waste is shipped more than 200 miles, the time limit is 270 days. The generator must never accumulate more than 6000 kg.

5. Before transportation, the generator must package, label and mark the waste according to DOT regulations. The marking must include the Generators name, address and manifest number.

6. Use only permitted waste transporters and storage and disposal facilities to dispose of the waste. If requested, they should be able to show you their permits. If the transporter fails to provide the appropriate placard, the generator must placard or offer the appropriate placards.

7. The waste must be shipped using a uniform hazardous waste manifest, and these must be kept on file for three years. Note that if the back copy of the manifest is not signed and received from the designated facility within 45 days of shipment, then and Exception Report must be filed with the Tennessee Department of Environment and Conservation. The hazardous waste manifest is used to track hazardous wastes from "cradle to grave". It also contains information for the transporter about the wastes in case of an emergency.

8. The company must submit by March 1 an Annual Report on waste activity for the previous calendar year. These forms are sent to generators with EPA ID numbers at the beginning of the calendar year.

9. Emergency Coordination:

   a. The generator must name an emergency coordinator who is either on premises or on call.

   b. The generator must post the following next to the telephone:
      1. The emergency coordinators name and phone number.
      2. The location of fire extinguishers, spill control material and fire alarm.
      3. The fire department phone number (unless there is a direct alarm).

   c. Employees must be thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities.

   d. If the generator has knowledge that a spill has reached surface water, the generator must notify the Tennessee Emergency Management Agency (800 262-3300) or the National Response Center (800 424-8802).

10. Preparedness and Prevention

   a. Facilities must be maintained and operated to minimize the possibility of fire, explosion or and unplanned release of hazardous waste.

   b. All facilities must have an internal communications or alarm capable of providing immediate emergency instruction (voice or signal).

   c. A device (e.g., telephone) to summons police, fire department or emergency response teams.

   d. Portable fire extinguishers, fire control equipment, spill control equipment and decontamination equipment.

   e. Whenever hazardous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access to an internal alarm or emergency communication (visual or voice contact) with another employee.

   f. Aisle space adequate to allow movement of personnel, fire and spill equipment around hazardous waste.

   g. Arrangements to familiarize police, fire departments, hospitals and emergency response teams to an emergency situations for the potential need of their services.

11. Containers must be in good condition and remain closed except when adding waste. Storage areas must be inspected weekly, looking for leaks and deterioration (See attached example checklist).

HAZARDOUS WASTE STORAGE

WEEKLY INSPECTION LOG

DATE OF INSPECTION _____

YES	NO	
☐	☐	ARE DRUMS LEAKING OR RUPTURED?
☐	☐	ARE DRUMS FREE OF DENTS, HOLES, RUST, ETC.?
☐	☐	ARE DRUM BUNGS CLOSED AND TIGHT?
☐	☐	ARE DRUMS MARKED PROPERLY?
☐	☐	IS THE ACCUMULATION DATE ON THE DRUM?
☐	☐	IS THERE A FIRE EXTINGUISHER IN THE VICINITY?
☐	☐	IS THERE PROPER AISLE SPACE BETWEEN DRUMS?
☐	☐	IS THERE SPILL CONTROL EQUIPMENT AVAILABLE?

CORRECTIVE ACTIONS TAKEN (INCLUDE DATE):

SIGNATURE OF INSPECTOR _____

Waste Streams

There are different types of waste streams generated in the automotive repair industry. Waste streams may be generated from cleaning up the shop area or cleaning parts to do repair work. Waste streams may also be generated during scheduled and nonscheduled maintenance and repair. Scheduled maintenance includes changing engine oil, oil filters, transmissions fluids and radiator fluids while nonscheduled maintenance includes replacing batteries, brakes, shocks and tires.

Solvent Waste Streams

Solvents, which are highly volatile and flammable, include alcohols, esters, ethers, ketones,amines, and aromatic and halogenated hydrocarbons. The 1984 RCRA amendments specified 5 categories of solvent waste (F001 to F005) to be banned from land disposal. In November, 1986 these amendments went into effect. Since solvent waste can no longer be disposed of at landfills, it has become necessary to either reduce the amount of solvent waste being generated, recycle the waste, or treat the waste through methods such as incineration.

In the automotive repair industry, solvent wastes are generated from parts cleaning operations and carburetor cleaners. If paint waste contains solvents, it would be regulated as a hazardous waste.

Parts Washing Solvent Wastes

Solvent parts washers may be used to clean parts that are needed for repair work. They operate by continuously recirculating the solvent from the solvent drum to the solvent wash tray. The solvent in a parts washer is usually replaced with fresh solvent once a month.

Solvent parts washers produce solvent wastes that are subject to RCRA reporting, minimization, and disposal requirements. The D001, F001 - F005 solvent wastes, and TCLP listed wastes are generated from parts washing and paint gun clean-up operations.

Because petroleum distillates, mineral spirits, and naphtha have flashpoints less than 140^{o} F, these wastes are hazardous and must be D001 manifested.

Carburetor Cleaners

There are four main solvent mixtures used as carburetor cleaners. They are:

Solvent Compound	Hazardous Waste Category
methylene chloride and phenol	D002, F001
petroleum distillates and phenol	D001, D002
methylene chloride and cresol	F001, F004
methylene chloride	F001

Most solvents currently being used as carburetor cleaners are regulated as hazardous waste. Some are regulated because of ignitability and others are "F listed" due to toxicity. These wastes may be incinerated or reclaimed by a TSDF.

Painting Wastes

Primarily, painting wastes result from overspray and paint gun cleaning operations. Waste paint thinner is generated when paint guns and other equipment are cleaned. Paint thinners may contain solvents such as xylene, methyl ethyl ketone, toluene, and acetone. Waste thinner is frequently collected and mixed in drums with waste paint. The drums are sent to a RCRA permitted solvent recycler or fuel blender.

Solvent-based waste paint is regulated as a hazardous waste if it demonstrates one of the characteristics of a hazardous waste (i.e., reactive, corrosive, toxic, ignitable). Many paints contain heavy metal compounds such as lead, cadmium and chromium and demonstrate the characteristic of toxicity. In all cases, waste paints with heavy metals and solvents must be managed as a hazardous waste.

If the paint wastes contain no heavy metal pigments and exists as a solid, the paint may be disposed in a landfill. Before landfill disposal, the generator must be granted a special waste approval from the Tennessee Department of Environment and Conservation to ensure that wastes are properly landfilled.

Solvents used as paint thinners are considered hazardous due to toxicity and ignitability characteristics. Most of these solvents have EPA waste codes of F003, F005 and D001. Solvents that demonstrate the EPA hazardous waste characteristics are banned from landfill disposal or discharge to a POTW.

Solvent and still bottoms are a RCRA hazardous waste and must be properly transported, stored, and treated and/or disposed of by a TSDF.

Paint Booth Filters

Vehicle maintenance facilities also generate paint booth exhaust filter wastes. The filters are paper-based or fiber material that require changing, which is dependent on the amount of painting being done. They collect paint overspray in the paint booth area. Waste filters are typically disposed of in landfills.

Waste paint booth filters need to be tested for toxicity characteristics. The "Toxicity Characteristic Leaching Procedure" (TCLP) determines the filter's toxic materials.

If the filters are not considered hazardous waste due to this characteristic, then they may be disposed in a landfill provided a special waste approval has been granted.

If the paint booth filters fail the TCLP test or are determined to have any of the characteristics of a hazardous waste, they cannot be disposed of in a landfill. The vehicle maintenance facility must contract with a hazardous waste management company to handle the filters.

Oil Waste Streams

Oil wastes may include used oil, used oil filters, and absorbents. Oil and used oil may be contained in underground storage tanks. The State of Tennessee regulates disposal of used oil filters as well as registration of underground storage tanks.

Used Oil

Generally motor oil contains additives and metals such as lead, zinc, phosphorus, vanadium, and barium. Used motor oils may have high concentrations of chromium from the wear of metal parts in the engine and can contain fuel, water, and antifreeze.

Waste oil has been exempted from most federal regulations in order to encourage recycling and energy recovery. Waste oil that is burned for energy recovery is exempted from EPA hazardous waste regulations unless it has been contaminated with another listed hazardous waste (e.g. chlorinated solvents). If the generator provides used oil directly to an end-user, the generator must register with EPA as a Used Oil Fuel Marketer. There are three options to manage waste oil properly:

(1) Work with a marketer who may provide the oil to end users. If a marketer transports your used oil to a cement kiln, asphalt plant, or industrial boiler and that used oil is processed to create energy, recycling requirements have been satisfied.

(2) Provide used oil to an end user directly. This option can increase liability so it is important to know who is hauling the used oil, who is using the used oil, and how and where the used oil is being used.

(3) Burn on-site in a used oil space heater.

In order to burn oil on-site as a heating fuel (option 3), the following criteria must be met: the furnace heating capacity cannot exceed 500,000 BTU/hr, the oil being burned cannot exceed 7 gal/hr, and the exhaust air from the furnace must be vented to outside air. If solvents or hazardous wastes have been added to the oil, it cannot be burned in an oil space heater.

Disposal of any waste oil, or any liquid in a sanitary landfill is unlawful. Road oiling is also prohibited.

Used Oil Filters

Used oil filters represent a significant waste stream due to the used oil that can be trapped in the metal gaskets and filter elements. In Tennessee, there are several different options available for disposing of used oil filters.

If the used oil is recycled and used oil filters are drained and crushed, used oil filters are exempt from hazardous waste regulations. Because the processing of filters (i.e. draining, crushing, and transporting) is not subject to hazardous waste regulations, the filters can be processed on- or off-site.

Oil filters that have been properly drained and mechanically crushed to remove free-flowing oil have statewide special waste approval for landfill disposal.
If a generator chooses not to recycle or crush the filters, the filters must be handled as a hazardous waste. Special waste approval will not be granted for

undrained and uncrushed filters. Any oil that drains from the filters must be disposed as a hazardous waste if it is not recycled.

Absorbents

Oil spills and other chemical leaks commonly occur in vehicle maintenance facilities. Absorbents, materials that absorb through capillary action, can contain and absorb oil spills quickly and safely. Traditionally, absorbents exist in the form of pads for minor spills and final clean-up, sweeps for sweeping thin slicks or rainbow sheens, blankets that can be cut to various sizes, pillows designed for confined areas such as sumps and holding tanks, and particulates which are dustless fibers that can be spread over a spill and retrieved by vacuum.

Sand and clay absorbents have been used in the past, but are not widely used today as they leach absorbed materials. Also, absorbents have been developed from sawdust, wood fibers, corn cobs, and peat moss.

Absorbents that are soaked may be incinerated or disposed in landfills provided the material is nonhazardous and special waste approval has been granted. However, if the absorbent is used to collect hazardous material, hazardous waste disposal requirements apply.

Underground Storage Tanks

Underground storage tanks (USTs) are devices designed to contain fuel, oil, and used oil. EPA says these tanks or any combination of tank and piping that is 10% or more beneath the ground is subject to the UST law. Many vehicle maintenance facilities are currently installing above ground storage tanks rather than USTs.

Each UST must be registered with the Division of Underground Storage Tanks, TDEC. New USTs must be equipped to prevent spills and overfills. Existing USTs must be upgraded to meet spill and overflow prevention requirements by December 1998.

New tank and piping installations must be protected from corrosion. Existing tanks and piping must be upgraded by December 1998. Tanks and piping must be equipped with leak detection systems.

In addition to paying an annual tank fee, owners are required to insure tanks for contamination cleanup and property damage.

The following tanks are exempted:

- Farm or residential tanks with a capacity of less than 1100 gallons, used non-commercially;
- Tanks storing heating oil used on the premise;
- Pipelines covered by Federal or State laws;
- Above ground tanks;
- Flow-through process tanks;
- Tanks in an underground area, but upon or above the surface of the floor;
- Tanks less than 110 gallons; and
- Septic tanks.

Aqueous Waste Streams

Aqueous cleaning methods are a substitute for parts cleaning operations that use solvents. The aqueous methods use water, detergents, acids, and alkaline compounds to displace soil rather than dissolving it in organic solvent. Aqueous wastes are water-based detergent wastes and waste sump solids. They are considered hazardous because they contain caustics, high levels of metals, and oily dirt.

Sumps and Floor Drains

Sumps and floor drains are found throughout many vehicle maintenance repair shops. The collection sumps are designed to store wastewater that results from cleaning and shop floor spills. The sumps may collect grit, dirt, grease, oil, soap, water, and solvents. These contents are subject to hazardous waste determination prior to disposal through the TCLP test. Non-hazardous sludges may require a Special Waste Approval before disposal in the landfill.

The nature of the sludge will determine the disposal method. Sludge samples should be TCLP tested. If the sludge passes a TCLP test and does not contain any other characteristic or listed wastes, then it may be disposed as a nonhazardous waste.

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Floor drains and sumps discharging directly to POTWs must comply with POTW pre-discharge rules and permit limits specific to the material discharged. Sump water should not be disposed as hazardous waste unless it is contaminated with hazardous waste.

Many facilities have sumps cleaned by a local septic tank cleaning company if the sump contents are non-hazardous.

A nonhazardous waste may be legally disposed in a landfill or through a POTW. Sludges that fail the TCLP test must be disposed as a hazardous waste.

Other Waste Streams

There are many other waste streams generated at auto repair facilities. With a few exceptions, the remaining waste streams are generated through nonscheduled maintenance/repair of vehicles.

Antifreeze

Antifreeze, or ethylene glycol, is a coolant used in most types of internal combustion engines. Most engines need a liquid medium to remove heat from the combustion area.

Many vehicle maintenance facilities discharge used antifreeze into the local POTW with the permission of the authorities. Some vehicle maintenance facilities collect their waste antifreeze for recycling through a commercial recycling company. However, there are barriers to recycling antifreeze because discharging into the POTW is cheaper than implementing many recycling efforts.

Used antifreeze consists of water and ethylene glycol which may demonstrate hazardous waste characteristics. New antifreeze is not hazardous. However, radiators that have lead soldered tanks will usually fail the TCLP for lead. Brass radiators may also leach lead. Many new vehicles have aluminum cores with plastic tanks. Since there is no soldering on these radiators, the antifreeze should not contain lead. POTWs may vary as to how much antifreeze they will accept from a generator.

Batteries

Vehicle batteries contain sulfuric acid and are made of 50 percent lead by weight. Recovery of lead from the more than 70 million automotive batteries scrapped annually accounts for nearly 40 percent of the lead produced in the U.S.

In Tennessee, it is illegal and wasteful to throw away lead-acid batteries.

The Solid Waste Management Act of 1991 requires retailers of lead-acid batteries to accept used lead-acid batteries for recycling purposes.

Asbestos Brake Pads

Asbestos can be found in brake pads of vehicles being serviced. Asbestos is not regulated as a RCRA hazardous waste but is regulated under the Clean Air Act, Section 112, 40 CFR Part 1910 **and** under the Tennessee Solid Waste (non-hazardous) Rules as a Special Waste, requiring an approval prior to disposal in a non-hazardous landfill. If handled improperly, asbestos can become a very dangerous waste. Asbestosis, a fatal lung disease, may result when asbestos is improperly managed and disposed.

Used Tires

Disposing of the scrap tires is a big issue. An estimated 249 million tires are scrapped each year in the U.S. Storing tires above ground is a fire hazard, because they are impossible to extinguish. They also cannot be stored without holding water. Therefore, they become ideal breeding grounds for mosquitoes.

The Solid Waste Management of 1991 requires that by January 1, 1995, each county in Tennessee provide at least one site to receive and to store whole used tires.

Effective October 1, 1991, retailers of tires have been required to collect and remit to the state a "pre-disposal fee" of $1.00 on each tire sold for use within the state. Funds will be used to purchase six mobile shredders which TDEC will operate throughout the state. The contract for the mobile shredders was awarded to SET TN Co. in July, 1992.

Rags

Rags of various sizes and types are typically found throughout an automotive repair facility. They are used to degrease and wipe cars, paint, solvent and oil spills.

Rags contaminated with solvents and other substances that may be RCRA hazardous wastes are not considered "a RCRA waste" if they are laundered by a commercial service. These rags are a hazardous waste if they are disposed.

Aerosol Cans

Aerosol cans offer industry a wide variety of products in a very convenient package. Brake cleaners and carburetor cleaners are typically sold in aerosol cans.

Currently, many landfill authorities are addressing aerosol cans that they manage. Aerosol cans should be completely empty for disposal.

Drums

Drums are used to contain both hazardous and nonhazardous materials. When allowed to accumulate, unused drums can become a significant waste stream for maintenance facilities.

A drum is empty if all material has been removed using the practices commonly employed to remove materials from that type of container, (e.g., pouring, pumping, and aspirating), **and** no more than one inch remains on the bottom of the 55 gallon container or inner liner.

For containers less than 110 gallons, empty containers contain less than 3% by weight of the original contents. For containers greater than 110 gallons, empty containers are defined as less than 0.3% of the original contents. It is important to manage empty drums properly, particularly if contents are hazardous substances.

Drums that contained acutely hazardous materials must be triple rinsed to be considered nonhazardous. Drums that have been tripled rinsed can be disposed of in a landfill. The wastewaters must be disposed of as a hazardous waste.

Scrap Metal

Stainless steel, iron, and chromium plated metals can be found in vehicle maintenance and repair facilities. These metals are usually removed from damaged vehicles or mechanical parts.

Currently, lead soldered metal plates, chromium plated metals and other plating chemicals that can be listed or characteristic hazardous wastes are required to be TCLP tested. Normally, with the exception of lead soldered metal plates, the plated metals listed above pass the TCLP and can be managed as non-hazardous solid wastes.

Freon

Refrigerants, or CFCs, function to cool air in mobile air conditioning units. However, CFCs are ozone depleters that produce long-term environmental damage and are considered to adversely affect human health.

The federal Clean Air Act Amendments of 1990 require vehicle maintenance facilities to recapture and recycle refrigerants from mobile air conditioners. The Act also requires that production of these chlorofluorocarbons be banned. The United States will ban the manufacture of CFCs (chlorofluorocarbons) by December 31, 1995. Venting refrigerants in the atmosphere is prohibited.

Hoses. Standard equipment hoses which move refrigerant through the equipment cannot be used without modification. High, middle, and low service hoses on the manifold gauge set must have shut off valves within 12 inches of the service ends to reduce the volume of refrigerants contained in the hoses that would be vented into the atmosphere. When hoses have been disconnected from the AC system or when the center hose has been connected to a device that can not handle refrigerant pressure, the refrigerant in the hoses must first be recovered.

Valves. To prevent venting of refrigerants, valves must be closed before the hoses are removed. Also, the valves must be closed when the hoses are not connected to the system or charging sources. Anti-blow back valves can be used to seal hoses after they have been removed from the system fittings.

Recovery Equipment. Specific manufacturers instructions for operating recycling equipment must be followed. The equipment is to be operated until the system is reduced from a positive pressure to a vacuum.

Recovery. Recovered refrigerants can either be recycled or stored. These refrigerants must be checked for noncondensables before they can be used. The standards for acceptable pressure and temperature for recycled refrigerants are found in SAE standard J 1989. The noncondensable test must be made after the refrigerant is stored at a temperature above 65° (or 18° C) for at least 12 hours. Also, the refrigerants must not be stored in direct sunlight.

Containers. When external portable containers are used to receive recycled refrigerant, they must be evacuated. A vacuum of at least 27 inches (or 75mm Torr) must be pulled prior to the transfer of recycled refrigerant. Filling containers should be done with great care. Refrigerant should only be stored in DOT or UL approved containers. If DOT approved they must be CFR Title 49 containers. Refrigerants expand when containers are exposed to high temperatures. High temperatures may cause contents to expand and explode. To reduce chances of exposure, the J1989 standard requires that containers not be filled pass 60% of the container's gross weight rating. Disposal containers (such as those used to ship refrigerant from the factory) must never be used for refilling. Any container used in charging is to be discarded after the refrigerant is recovered. The container should be attached to the recovery instrument and refrigerant removed. When a container has been reduced from a pressure to a vacuum, the container valve can be closed. It should be marked empty and disposed properly.

Which of the following waste streams does your facility generate? Have you eliminated, reduced, or recycled any of these streams? If so, comment on actions taken.

GENERATED		ELIMINATED	REDUCED	RECYCLED	COMMENTS
	Parts Washing Solvent [*]				
	Carburetor Cleaners [*]				
	Painting Wastes [*]				
	Paint Booth Filters				
	Used Oil				
	Used Oil Filters				
	Antifreeze				
	Batteries				
	Sumps and Floor Drains				
	Rags				
	Aerosol Cans				
	Drums				
	Scrap Metal				
	Freon				
	Absorbents				
	Used Tires				
	Asbestos Brake Pads				

[*] Usually RCRA Hazardous Waste

Waste Stream Reduction Recommendations

Three main methods of waste reduction are source reduction, recycling, and treatment options. Source reduction is the most preferred method followed by recycling and then treatment options. When determining methods to reduce waste, be sure to perform a thorough assessment of your operation and select the options that are most technically and economically feasible.

Solvent Waste Streams

As already stated, solvent waste streams are banned from land disposal. Different methods for minimizing solvent waste include eliminating the need to use a solvent, using substitutions, and segregation, recycling, recovery, or reuse of the waste. Ways to accomplish these objectives range from product substitution to monitoring solvent composition. You can also increase cleaning efficiency and install on-site solvent recovery equipment.

Parts Washing Solvent Wastes

Three waste reduction recommendations for parts washing solvent wastes are:

- Distillation
- Better Operating Procedures
- Alternative Cleaning

Many waste solvents can be recycled with a **distillation** unit. A distillation unit employs a separation technique that relies on boiling point differences of the components of the waste. There are small distillation units available which could permit reuse of solvents.

Efficient **operating procedures** for parts washing can help eliminate some of the solvent wastes. For example, do not have more parts washer stations than necessary nor schedule unnecessary "pick ups". Neglect of these two combined strategies could unnecessarily change your status from small quantity generator to large quantity generator.

Do not locate parts washer stations near exhaust fans and door drafts. Pumps that are continuously running volatilizes the product into the air. Make sure parts washers are off when not in use. If the parts washers have lids, keep lids closed when not in use.

When looking for **alternative cleaning** methods, look for non-hazardous alternatives. Solvent 140 is a petroleum distillate that is considered non-hazardous (non-ignitable) because it has been formulated so that the flash point is higher than 140° F.

Hot soap cleaners are very effective parts washing materials. A hot soap washer may replace parts washers and eliminate all hazardous wastes associated with parts cleaning. Oil skimmers can recover the oil before water is discharged to the POTW. However, wastewater authorities should be consulted to determine if any local limits restrict hot soap wastewater discharges.

Carburetor Cleaners

Carburetor cleaners are corrosive liquids which contain chlorinated compounds. The carburetor cleaner compound has been reformulated to exclude the use of 1, 1, 1, trichloroethane which is a skin irritant. There are companies that have developed substitutes for hazardous carburetor cleaners. Determine if non-hazardous carburetor cleaners can be used as opposed to traditional ones.

Carburetor cleaner should be segregated from other wastes.

Painting Wastes

There are several different ways that painting wastes can be reduced. The methods discussed below include improving operating procedures, utilizing different equipment and paints, instigating a more efficient inventory control, and reducing overspray.

Operating Procedures

Allow solids to settle out of the solvent used for cleaning painting equipment. The clean solvent can be used for cleaning or for paint thinning. Then only the sludge will need disposal.

Keep paint and paint thinner wastes separate. Thinners can be reclaimed and reused. Thinners should be used until their cleaning capabilities have been exhausted. Thinner used as gun cleaner should be saved and reused to thin the next batch of same color paint.

Control paint quality to avoid defective batches. Do not mix more paint than is needed for a painting job.

Equipment

Consider investing in a gun cleaner that recirculates the wash. Gun cleaners can save you as much as 30% on disposal and raw materials costs.

Recycling of paint thinners and solvents such as xylene can be done on-site with a distillation unit or off-site through a solvent recycler. Distillation units used to reclaim solvents can also be used to recycle paint thinners. Distillation units have been shown to significantly reduce waste generation and disposal costs.

Paint still bottoms have been successfully used to provide undercoatings to protect undercarriages from salt corrosion and rusting.

Use heaters to reduce paint viscosity instead of adding thinners.

Investigate the use of high volume low pressure or electrosatic paint technology.

Paints

Investigate the possibility of replacing solvent-based paints with water-based paints to eliminate the use of solvents and thinners as cleaners. Using paints without metal pigments or paints with a high solid low volatile organic compound will also help reduce waste.

Inventory Control

Controlling inventory is important when trying to reduce waste. It helps to eliminate excess supplies which minimizes waste to be discarded. Two procedures that can help control inventory are:

- Purchasing paints only in quantities needed to avoid discard.

- Adopting first-in, first-out inventory practices to reduce wastes associated with expired shelf life.

Overspray Reduction

To reduce overspray:

- Use equipment with low overspray. High volume low pressure (HVLP) guns provide the high transfer efficiencies.

- Maintain proper pressure as identified in the operator's manual for specific gun systems. Higher pressures contribute to overspray.

- Clean spray gun nozzles.

- Replace damaged nozzles.
- Keep spray gun perpendicular to the surface.
- Maintain a fifty percent overlap of spray pattern.
- Maintain gun distance of six to eight inches from workpiece.
- Trigger gun at the beginning and end of each stroke.

Paint Booth Filters

Vehicle maintenance facilities should test paint booth filters for TCLP parameters or determine if the filters are nonhazardous. If the used filters are dry and no heavy metal paints are used, the filters can be classified as nonhazardous wastes.

If it is possible to determine the paint that causes the filters to be hazardous, discontinue the use of the paint and find alternatives.

If the filters are hazardous, they must be disposed by a TSDF. There are certain precautions to be taken when selecting a TSDF.

Use a drum compactor to place as many filters as possible into the drum when disposing. Filters must be completely dry to avoid ignition.

Oil Waste Streams

Different procedures that can be used to minimize waste oil include installing drip pans, recyling the used oil by using it in a different process, and preventing spills. Waste oil is usually stored in undergound storage tanks before being picked up by an off-site recycler. Avoid contaminating used oil with other hazardous and nonhazardous liquids. The cleaner the waste oil, is the more value it holds in the marketplace.

Used Oil

Keep storage tanks and containers in good condition. Make sure that storage tanks are labeled "used oil". Store used oil in areas with oil-impervious flooring and secondary containment structures.

To protect the environment, clean up used oil spills or leaks. Do not use used oil for dust suppressing or weed killing around fence posts.

It is important to use a transporter with an EPA identification (ID) number when shipping used oil off-site. Generators should know that the waste oil hauler has made appropriate notifications and know that the used oil is stored, recycled, and managed properly.

Determine if lube oils can be reclaimed. There are companies that recycle lube oils on-site.

On- or off-site energy recovery of waste oil is recommended. It is important that the generator know how the waste oil is being managed and recycled to avoid liability and non-compliance problems.

Seek companies that pay for the waste oil collected at the facilities as opposed to companies that charge to dispose.

Do not mix wastes like antifreeze with the used oil. If a mixture of antifreeze and oil is accidently generated, antifreeze should be separated from the oil waste.

Prevent degreasing solvents (chlorinated hydrocarbons) from contaminating used oil. This practice may make the oil subject to regulation as a hazardous waste. When hazardous wastes are mixed with used oil, the oil is no longer subject to the recycling exclusion.

Used Oil Filters

Filters should be drained of free liquids prior to final disposal. This is best accomplished by tipping the filters at an angle to allow remaining oil to drain into a collection tray. Pilot projects show that almost 50% of the oil in a filter can be recovered in 5 minutes if the filter is tipped at angle during drainage and if the drainage occurs while the oil is still warm. Punching holes in the top center of the filter has proven to improve drainage. Ideally, filters should drain 2-3 days so free-flowing oil can be recovered.

Oil filter presses crush the filter canisters and help facilitate oil removal. These presses can be purchased at a reasonable cost. With presses, approximately 85% of the remaining oil can be recovered.

Absorbents

Select absorbents that are wringable and can be reused more than once to reduce raw materials, disposal costs, and clean up time. Some absorbents have been used as much as 17 times.

Consider purchasing absorbents, such as special formulated peat moss, that will not easily leachate in landfills. Always check with landfill authorities to determine if they will accept certain absorbents containing chemicals. Some restrictions may apply.

Underground Storage Tanks

When possible, use properly diked, above ground storage tank . Consult with Tennessee Department of Environment and Conservation - Division of Underground Storage Tanks and The University of Tennessee Center for Industrial Services for additional regulatory information.

Aqueous Waste Streams

Aqueous cleaning methods are an alternative to using solvent based cleaning methods. One disadvantage to using aqueous methods is that parts are wet after cleaning and they may rust. Aqueous cleaning methods include bake-off ovens, wire brushing, and detergent-based cleaners.

Sumps and Floor Drains

If a septic tank cleaning company is disposing non-hazardous wastes, know the final disposition of the sludge. It is important to know the final disposal sites of all hazardous and non-hazardous sludge.

The sludge of sumps and floor drains must be TCLP tested for hazardous waste determination as metals and solvents are frequently present in these collection systems. Also, POTWs may have oil and grease discharge limits. Water may be discharged after oil and grease are removed.

Consider using oil/water separators or skimmers to remove free floating oils and grease. Implementation of this recommendation may allow wastewater to be discharged to POTWs. Oil and grease must be disposed by TSDFs if they fail the TCLP test. These fluids may be eligible for on-site small furnace use up to 7 gal/hr.

Use drip pans to contain drips when changing fluids or working on damaged vehicles. Oils and fluids from these vehicles may contribute to sump contamination.

Other Waste Streams

There is a great deal of diversity in waste streams found in automotive repair facilities. Because of this it is important to remember to segregate your incompatible waste streams. Organization and management can help reduce waste. Be sure to contract with recyclers and waste handlers for the waste that can not be disposed of in-house.

Antifreeze

Used antifreeze can often be recycled in-house by removing contaminants and rebalancing the anti-freeze formulation. Consider investing in a recycling system that removes particulates and colloidal silica (both are harmful to the coolant system) and provides an additive package to restore anti-corrosion properties to the coolant.

The used filters from antifreeze recycling equipment are potentially hazardous due to the concentration of contaminants. If on-site antifreeze recycling equipment is used, the filters should be TCLP tested.

Determine if on- or off-site antifreeze recycling will best serve your needs.

Batteries

Proper maintenance can significantly affect the life of a vehicle battery and the likelihood of an engine starting. Maintenance procedures include:

- Monitoring and maintaining battery fluid at the proper level.

- Determining whether the quality of water added to the battery will extend the life of the battery. Some vehicle maintenance professionals believe distilled or deionized water achieves this end.

- Making sure brackets holding the battery are not corroded. Corroded brackets allow the battery to shift resulting in vibration damage.

- Making sure battery connections are clean. A water and baking soda mixture removes corrosion allowing for better current flow

- Placing a heavy grease or commercial corrosion prevention product on the posts to retard the accumulation of corrosion.

Asbestos Brake Pads

Asbestos dust from brake pads should be vacuumed off all parts before disassembly begins. Vacuum bags should then be double bagged in plastic, or single bagged in plastic and placed in a sealed drum for transportation.

Asbestos should be transported in closed containers and packed in a manner to prevent tipping, spilling, or breaking during transporting.

During temporary storage, asbestos dust should be contained and collected in a manner to prevent airborne contamination and human exposure.

Asbestos brake pads can be disposed of in a landfill. Generally, asbestos will be hand placed and buried separately from other garbage then covered with dirt prior to compacting. However, the local landfill authorities should be contacted.

Used Tires

Used tires can be recapped and used again. While there is not a big demand for recapped tires, it is an option to replacement.

As stated earlier, The Solid Waste Management Act of 1991 requires that by January 1, 1995, each county in Tennessee provide at least one site to receive and to store whole used tires. The State has contracted with the SET TN Co. to shred the tires at each landfill so the tires can be landfilled in a normal fashion. This operation is being funded with the "pre-disposal fees" that retailers are collecting and remitting to the state.

Rags

Designate an area for storing rags that are to be laundered. The rags should be stored in a metal container with a tight-fitting lid. Make sure the rags do not contain free liquid solvents. Before storing, rags should be wrung dry with a small wringer. This practice will ensure that most waste solvent in the rags is recovered.

To help keep track of rags, install an inventory control system where service persons must return rags before receiving rags.

Management practices for rags include:

- Use non-hazardous cleaning solvents whenever possible
- Use cloth or other durable material shop towels
- Wring out soiled towels before placing in collection drums
- Use centrifuge or mechanical ringer, if appropriate
- Make sure no towels bearing free liquids are placed in drums
- Make sure liner system (nylon or mesh bag) is in good working order and hangs at correct height
- If excess liquid collects at bottom of drum, decant into waste solvent collection drum; manage the liquid appropriately
- If collected liquid meets RCRA criteria (listed, characteristic, etc.) manage as a hazardous solvent waste
- Always collect, store, and transport in closed containers
- Manage containers holding flammable materials according to all local fire department standards
- Share your Material Safety Data Sheets with route salespeople

Do Not:

- Air dry soiled shop towels
- Pick up spills of hazardous liquids with towels
- Dispose of excess chemicals by pouring onto towels
- Put towels with free liquids in collection system
- Allow towels in drum to contact excess liquid (liner should always hang high enough to prevent this)
- Pre-wash or launder shop towels on your own

Aerosol Cans

To increase the shelf-life of aerosol cans, keep them away from moisture, sunlight, and extreme heat and cold. It is also important to keep the protective caps on the containers when not in use. This helps prevent contamination, rusting of the container top, and nozzle damage.

An inventory control system can assist in reducing waste. Order products according to demand because expired shelf life may require excess inventories to be disposed. Dispense aerosol cans through one person in one location to prevent unnecessary usage.

If possible, purchase alternative brake and carburetor cleaners that do not contain CFCs.

Drums

Try to use a supplier who will receive empty drums and negotiate with the supplier to use returnable drums and totes to ship materials. Totes are currently used to transport alkaline cleaners, coolants, solvents, adhesives, paints, and inks.

Empty containers can be sent to scrap metal vendors. However, you may want to consider crushing or cutting the drums and containers to ensure that they are not being reused for storing or transporting other material. Before cutting or crushing drums, determine if the drum contained flammable material. These drums may contain an explosive mixture of air and vapor. Drums should be thoroughly purged before cutting.

Determine the feasibility of purchasing a drum crusher. Visit your scrap metal vendor to note how scrap is handled. Ask questions on how your scrap is received and processed. Tour the company to monitor how the containers are managed.

Determine if a drum reclamation company can recondition your drums for resale. Investigate drum reclamation and recycling sites to ensure that your drums are managed responsibly and lawfully. If a drum is legally empty and is sold to a drum reclaimer/recycler, the generator should be exempted from future liability associated with that drum.

Scrap Metal

Separate your steel scrap metal from your other wastes such as copper, tin, and aluminum. Locate and visit a metal scrap vendor that will purchase your separated metals. During the visit, note how scrap is handled and ask questions on how your scrap would be received and processed.

Freon

All mobile air conditioning systems should be checked for leaks. The mobile system must be able to hold a deep vacuum for at least one minute. A hand held leak detector is an adequate device for detecting leaks. All leaks should be completely repaired before refrigerant is placed in a mobile air conditioning system. Check anti-blow back valves periodically to be certain that the system is properly functioning.

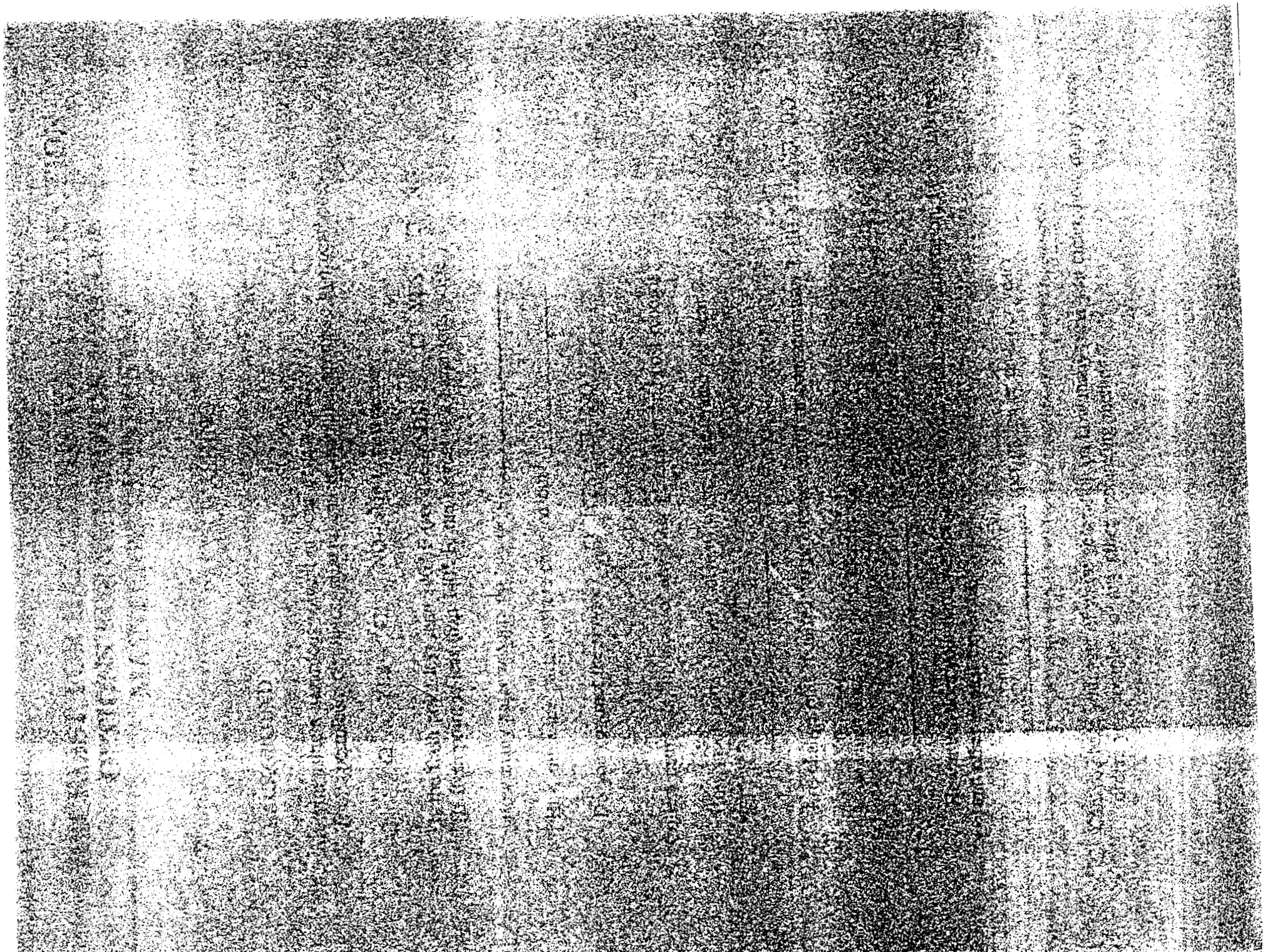
Recover refrigerants in accordance with the equipment manufacturers instructions. Consult CFR Title 49 to determine container standards, SAE standard 1989J for acceptable pressure and temperature requirements for using recycled refrigerants, and J1989 standard for container filling limits.

Energy/Emission Losses

Garages are usually heavy energy loss areas because of:

- their structure,
- their in and out conveyance, and
- their large exhaust requirements.

To reduce these losses and costs every effort should be made to use spent petroleum products for fuel or for other process heating needs. Install down draft air fan curtains to outside access doors and install air conveying heat exchange fans near exhaust areas.



CHECKLIST FOR HAZARDOUS WASTE REDUCTION OPTIONS FOR THE MOTOR VEHICLE MAINTENANCE INDUSTRY

PARTS WASHING

I. BACKGROUND

A. Are you using a hazardous solvent in your parts washer(s) ?
(i.e.: petroleum distillates, mineral spirits, naphtha, aromatic hydrocarbons)

☐ YES ☐ NO - skip to next section

Is the flash point less than 140° F (see the MSDS) ? ☐ YES ☐ NO
(If flash point is less than 140° F, the solvent is a hazardous waste.)

How many parts washers do you have? _____

How often are parts washers changed out? _____

Do you contract the service? ☐ YES ☐ NO

B. Collect manifests, invoices or any other generation and cost records.

How much parts cleaner (solvent) waste is generated per year ?

_____ gallons

Are change outs required for unforeseen spills or contamination ? ☐ YES ☐ NO

How much does your parts cleaner solvent cost ?

_____ per gallon/per year

How much does your parts washer disposal cost ? Include transportation, labor, lab tests and other related expenses.

_____ (per gallon or tank/per year)

C. Can you base your rate of waste generation on how many parts you clean, how many work orders you complete or any other accounting method ?

II. ELIMINATION/SUBSTITUTION:

Have you tried a non-hazardous cleaner:

Solvent with flash point greater than 140° F ? ☐ YES ☐ NO

Aqueous cleaner ? ☐ YES ☐ NO

1) Look for non-hazardous alternatives. Solvent 140 is a petroleum distillate that is considered non-hazardous (non-ignitable) because it has been formulated so that the flash point is higher than 140° F.

Have you checked with suppliers to determine availability?
Have you tried such a product? Does it clean suitably?
Are you adding anything to the solvent that would lower the flash point?

List any barriers or impediments (technical or economical):

What are the positive and negative effects on environment, health and safety and other reduction efforts?

2) Hot soap cleaners or other aqueous cleaners are very effective parts wash materials. A hot soap washer may replace parts washers and eliminate all hazardous wastes associated with parts cleaning. Oil skimmers can recover the oil before water is discharged to the POTW. However, wastewater authorities should be consulted to determine if any local limits restrict hot soap wastewater discharges.

Will aqueous cleaners effectively clean all necessary parts?
Due to the cost, could you feasibly replace all parts washers with fewer aqueous cleaners?
Can you discharge the wastewater to the sewer?

List any barriers or impediments (technical or economical):

What are the positive and negative effects on environment, health and safety and other reduction efforts?

III. SOURCE REDUCTION:

1) Are washers located near exhaust fans or door drafts? ☒ YES ☐ NO

Do not locate parts washer stations near exhaust fans and door drafts. Keep covers closed when not in use. This will reduce evaporation.

2) Is solvent "no longer effective" when it is changed out? ☒ YES ☐ NO

Do not have more parts washer stations than necessary nor schedule unnecessary "pick ups".

3) Are parts washers "off" when not in use? ☒ YES ☐ NO

Pumps that are continuously running volatilizes the product into the air. Make sure parts washers are "off" when not in use.

4) Are washers kept covered when not in use? ☐ YES ☐ NO

Keep washers covered when not in use to reduce evaporation.

5) How/where do parts drip/dry when removed from washer? ☐ YES ☐ NO

Let parts drip dry over a drainboard that drains back into the washer. This will reduce solvent loss and improve housekeeping.

6) Are you mixing any non-hazardous chemicals with this waste? ☐ YES ☐ NO

Do not add any non-hazardous substance to the solvent that will increase the volume of waste generated. Keep hazardous and non-hazardous wastes segregated.

7) Are employees trained in proper handling? ☐ YES ☐ NO

List any barriers or impediments (technical or economical):

What are the positive and negative effects on environment, health and safety and other reduction efforts?

IV. RECYCLING:

1) Could you reuse solvent considered "spent" in one operation in an operation where solvent does not have to be as clean? ☐ YES ☐ NO

Some cleaning operations require a much higher level of cleanliness. Can solvent that is considered too dirty to be used in one operation be transferred and reused in another operation?

2) Do you recycle the solvent on-site (distill)? ☐ YES ☐ NO

Install an on-site distillation unit (or other recycling system).

Do you use more than one type of solvent?
Do you have enough volume for a distillation unit to be feasible?
Will distilled solvent meet your cleaning needs?

3) Is the solvent being sent for recycling or fuels blending off-site? ☐ YES ☐ NO

List any barriers or impediments (technical or economical):

What are the positive and negative effects on environment, health and safety and other reduction efforts?

PAINTING

I. BACKGROUND

A. What type of paint are you currently using? Circle.

solvent-based
water-based
contains lead
contains heavy metals

Are you mixing any of the above together? _____

Are you thinning the paint? If so, thinner name? _____

Do you have a spray booth? How many? _____

Is it enclosed? ☐ YES ☐ NO

What type? Circle.

dry filter
water-curtain
powder coat

If using dry filter, what type? Circle.

fiber glass
paper
styrofoam
metal
other _____

How often do you change filters? _____

Are you mixing waste paint with waste thinner? ☐ YES ☐ NO

How do you dispose of this waste? Circle.

On-site recycling
Off-site recycling
Fuels blending
Other _____

Do you have a collection/recycle/repurchase contract?

If so, with who? _____

How often? _____

B. Collect manifests, invoices or any other generation and cost records.

How much paint/thinner waste is generated per year? (separate if applicable)

_____ gallons

Are change outs required for unforeseen spills or contamination? ☐ YES ☐ NO

What is the cost of your paint and thinner?

_____ (paint) per gallon/per year

_____ (thinner) per gallon/per year

What is your waste disposal cost? Include transportation, labor, lab tests and other related expenses.

_____ per gallon/per year

C. Can you base your rate of waste generation on how many parts you clean, how many work orders you complete or any other accounting method ?

II. ELIMINATION/SUBSTITUTION:

Have you tried a non-hazardous paint (some water-based paints, some powder paints)?

☐ YES ☐ NO

If using paints with heavy metals, have you tried a paint without heavy metals?

☐ YES ☐ NO

Have you tried a high-solids paint? ☐ YES ☐ NO

1) Investigate the possibility of replacing solvent-based paints with water-based paints to eliminate the use of solvents and thinners as cleaners.

Use paint without metal pigments.

Use high solids low volatile organic compound paints.

List any barriers or impediments (technical or economical).

What are the positive and negative effects on environment, health and safety and other reduction efforts?

III. SOURCE REDUCTION:

1) Do you mix only enough paint to complete a job? ☐ YES ☐ NO

Most small cars can be painted entirely with one quart of paint; touch-ups and damage repair would use substantially less. Different size paint mixing and sprayer cups would enable operators to use the best size. This would mean a source reduction in two ways. It would limit overmixing and decrease the amount of clean-up solvent needed. However, weighing accuracy becomes more critical.

2) Do you use a gun cleaner that recirculates the solvent? ☐ YES ☐ NO

Consider investigating in a gun cleaner that recirculates the wash. Gun cleaners can save as much as 30% on disposal and raw material costs. Rather than filling the spray cup with solvent and spraying the solvent into the booth or air, thinner is sprayed through the gun into the cleaning station where it is condensed for reuse.

3) Are all paint/thinner container lids kept closed when not in use? ☐ YES ☐ NO

Keep all solvent container lids closed to reduce evaporation.

4) Do you reduce paint viscosity with heaters? ☐ YES ☐ NO

Paint viscosity is often reduced using thinners. Investigate the use of heaters to reduce viscosity.

5) Do you control paint inventories to avoid unnecessary disposal? ☐ YES ☐ NO

Purchase paints only in quantities needed to avoid discard. Adopt a first-in, first-out inventory practice to reduce wastes associated with expired shelf life.

6) Do you train operators to reduce overspray? ☐ YES ☐ NO

Train operators to reduce overspray:

a. Use equipment with low overspray. High volume low pressure (HVLP) guns provide high transfer efficiencies.

b. Maintain proper pressure as identified in operator's manual for specific gun systems. Higher pressures causes paint to bounce off the car and form a fog.

c. Clean spray gun nozzles.

d. Replace damaged nozzles.

e. Maintain a fifty percent overlap of spray pattern.

f. Keep spray gun perpendicular to the surface.

g. Maintain gun distance of six to eight inches from workpiece.

h. Trigger gun at the beginning and end of each stroke.

i. Do not arc the spray gun and blow paint into the air.

7) Is solvent minimized when cleaning paint cups? ☐ YES ☐ NO

Paint cups should first be scraped free of paint using a plastic spatula and then rinsed with solvent. New Teflon-lined metal paint cups provide easier clean-up.

List any barriers or impediments (technical or economical).

What are the positive and negative effects on environment, health and safety and other reduction efforts?

IV: RECYCLING:

1) Do you reuse solvent until its cleaning capability is exhausted? ☐ YES ☐ NO

2) Could you reuse solvent considered "spent" in one operation in an operation where solvent does not have to be as clean? ☐ YES ☐ NO

3) Do you use gun cleaning solvent to thin paint? ☐ YES ☐ NO

Thinners should be used until the cleaning capacity has been exhausted. If your disposal is set up on a contract basis, make sure solvent is fully exhausted before it is collected for disposal.

4) Do you settle solids out of solvents and reuse the solvent for cleaning or thinning?

☐ YES ☐ NO

Gravity separation is inexpensive and relatively easy. The thinner/sludge can be allowed to settle. The clear thinner can be pumped off and used for cleaning. Then only the sludge needs to be disposed.

5) Do you distill solvent on-site? ☐ YES ☐ NO

Recycling of paint thinners and solvents can be done on-site with a distillation unit or off-site through a solvent recycler. Distillation units used to reclaim solvents can also be used to recycle paint thinners. Distillation units have been shown to significantly reduce waste generation and disposal costs.

Paint still bottoms have been successfully used to provide undercoatings to protect undercarriages from salt corrosion and rusting.

6) Is solvent sent off-site for fuels blending or recycling? ☐ YES ☐ NO

List any barriers or impediments (technical or economical).

What are the positive and negative effects on environment, health and safety and other reduction efforts?

STATEMENT OF SCOPE AND OBJECTIVES

This section will tell in concise form the following:

SCOPE: What and whom the plan involves, and why.

OBJECTIVES: What the plan is expected to accomplish, and when.

MEANS: What and who will be used to accomplish it.

Choose from the items below what you want to include in your statement.

I. Scope

A. Why will we do it?

		Check Off
√	To comply with the Tennessee Hazardous Waste Reduction Act	_____
√	To reduce the company's impact on the environment	_____
√	To improve corporate image	_____
√	To protect employees	_____
√	Other _____	_____

B. Who will be involved?

√	Corporate management	_____
√	All employees	_____
√	Other _____	_____

C. What wastes will we reduce?

√	RCRA hazardous wastes	_____
√	Packaging wastes	_____
√	Office paper	_____
√	Raw materials	_____
√	Manufacturing scrap	_____
√	Wastewater	_____
√	Energy	_____
√	Fugitive emissions	_____
√	Other _____	_____
√	Other _____	_____

II. Objectives

A. What is our final goal?

Check Off

√ To reduce all waste streams (as defined in the plan's Scope) to the technically feasible and economically practicable minimum. _____

√ To reduce RCRA hazardous wastes by ____% _____

√ Other _____ _____

B. By what dates?

√ In calendar year 1994 _____

√ By June 30, 1995 _____

√ Each year until eliminated _____

√ According to timetable(s) given elsewhere _____

√ Other _____ _____

III. Means

A. What will we use to accomplish our objectives?

√ Waste Reduction Assessment every _____(months)(year)(years) _____

√ New processes, equipment or process changes _____

√ Employee training _____

√ Raw material substitution _____

√ Waste tracking system _____

√ Charging waste management cost to generating department _____

√ Improved maintenance _____

√ Improved scheduling _____

√ On-Site recycling _____

√ Off-Site recycling _____

√ Waste stream segregation _____

√ Employee incentives _____

√ Other _____ _____

B. Who will be responsible?

√ An individual (Name_____) _____

√ A position (Job Title _____) _____

√ A team described elsewhere _____

√ Individuals or positions, depending on area of responsibility _____

√ Other _____ _____

Now, take your choices and put them together into a one-page or shorter statement.

Treatment Storage Disposal Facilities
[TSDFs]

Laidlaw Environmental Services
3300 Cummings Rd.
Chattanooga, TN 37419
615-821-6926

Laidlaw Environmental Services
P. O. Box 90
Athens, TN 37303
615-745-9222

Bryson Recovery Services
552 Rivergate Rd.
Memphis, TN 38109
901-774-8146

Laidlaw Environmental Services
2815 Old Greenbrier Pike
Greenbrier, TN 37073
615-643-4511

Tricil Environmental Services Inc.
1640 Antioch Pike
Antioch, TN 37013
615-833-2059

Tricil Environmental Management
3556 Fite Rd.
Millington, TN 38058
901-357-3600

American Resource Recovery Corp
901 E. Bodley
Memphis, 38106
901-774-2340

Ashland Chemical Company
P.O. Box 13305
Memphis, TN 38113
901-775-9062

OSCO, Inc.
P.O. Box 1203
Columbia, TN 38402
615-381-4999

Earth Industrial Waste Management, Inc.
3536 Fite Road
Millington, TN 38053
901-358-5659

What a Small Quantity Generator Should Look for in a Transporter

This article was reprinted from Hazardous Waste Management Magazine, *September 1989, by Steve Newell.*

In today's world of new environmental regulations and new legal liabilities involving hazardous waste, a small quantity generator can easily become overwhelmed. It becomes necessary to get information and help from a source that is reliable—and at a reasonable cost. The answers to the problems that a small quantity generator faces concerning transportation disposal and consulting with regard to hazardous waste can often be found in a reputable transportation company. A good transporter has the resources within its company to answer questions not only about new regulations but also about disposal site alternatives and analytical needs.

The following is a good reference list of some of the items a generator should look for in his selection of a transporter:

Insurance

The first piece of information you should request is a copy of the insurance coverage a transporter, by law, is required to have. Check with state officials to make sure that the policy has the minimum coverage that is required.

References

Often one of the best ways to determine the reliability of a transporter is through his past experience. Ask questions about reliability and safety practices.

Safety/Training

In handling hazardous substances, a transporter should have employees that are knowledgeable and that are trained to handle any situation that might arise. Check if the company has a formal training program. Also check with state agencies on any safety violations the transporter might have had.

Environmental Staff

Look for a company with a full-time environmentalist on staff. Having a full-time environmentalist helps the company to be up-to-date on the latest issues that concern the small-time generator who probably doesn't have the time or the resources to be current on issues such as new manifest regulations; safety and training requirements; and overall environmental compliance.

> In handling the problem of transportation and disposal of hazardous waste, the old cliche often applies: "You can do it the right way and pay a little more now, or you can do it the wrong way and pay a lot more later."

Equipment

The transporter you choose must have not only the proper equipment to handle your needs but also the proper licensing. Check with the state DOT to find if they have licenses for their vehicles. Visually check the vehicles for these licenses. Also check the vehicles for cleanliness and overall care.

Emergency Response

Find out if the transporter has a plan of action to handle an emergency spill that could occur while your waste is in transport. does the company have trained personnel and equipment to respond to a spill situation? If not, does it have a list of emergency response contractors that are located along the transport route?

Disposal Options

If you are in doubt about where your waste should go, does the transporter give you information concerning options on sites and methods for disposal? Also, they should have contact names and insurance papers on the site you choose to send your waste to.

Cost Effectiveness

For small quantities of waste, does the transporter have a "milk run" program where some of the cost of transportation can be shared by other generators transporting compatible waste on the same load?

Site Check

Go to the site of the transporter and take a tour of the facility. Look for a clean yard and clean equipment. If they do not invite you to their facility, make sure you ask if you can visit.

Courtesy

Make sure the transporter is helpful and courteous. It makes the tough job of handling waste much easier.

Reasonable Cost

A good transporter that can provide the above services will most likely not be the least expensive transporter. A generator must decide what is a reasonable price for the services to be received. In handling the problem of transportation and disposal of hazardous waste, the old cliche often applies: "You can do it the right way and pay a little more now, or you can do it the wrong way and pay a lot more later." ❑

BATCH DISTILLATION SYSTEMS

Equipment Vendor

Finish Engineering
Local Rep: Herb Cobb
400 Westbrook Drive
Raleigh, NC 27609
919-846-0062

Recyclene
Local Rep: Activation
8041-F Arrowbridge Boulevard
Charlotte, NC 28210
704-527-6880

Disti, Inc.
525 Boulevard Street
Kenilworth, NJ 07033
201-272-7600

Lanair, Inc. (Recyclit)
P. O. Box 1017
Janesville, WI 53547
1-800-356-9424

Ecology Equipment, Inc. (Durastiller)
Local Rep: Equipment Associates
920 Blairhill Road, Suite 104
Charlotte, NC 28210
704-522-0170

Progressive Recovery, Inc.
1020 North Main Street
Medina, OH 62236
216-723-3366

Interel Corporation
P. O. Box 4676
Englewood, CO 80155
303-773-0753

Acra Electric Corporation
3801 N. 25th Avenue
Schiller Park, IL 60176-2187
312-678-8870

Hoyt Corporation
Forge Road
Westport, MA 02790-0217
1-800-343-9411